

THE IMPORTANCE OF UNIVERSITIES FOR SOCIETY AND ECONOMY THE EXPERIENCE OF RESEARCHERS FROM THE VISEGRÁD GROUP

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CHAPTER 8

Redefining Excellence: AI-Enhanced Digital Competencies in Tertiary Education

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Abstract: This chapter explores how AI and the demand for new competencies are reshaping university teaching, with a focus on instructional design, newskilling, and curriculum modernization. AI offers personalized learning experiences, fostering critical thinking and deeper engagement with educational materials. However, this transformation requires educators to adapt through newskilling and integrate ethical considerations into teaching. The findings indicate that AI has the potential to revolutionize higher education by equipping students with future-ready skills while simultaneously emphasizing the importance of preserving humanistic values such as empathy and interpersonal connections in teaching.

Keywords: AI-enhanced digital competency, educational technology, instructional design, newskilling, curriculum innovation



8.1. Introduction

Integrating artificial intelligence (AI) into university teaching represents a major step towards modernising the whole educational process. This trend not only unlocks new possibilities for personalising teaching and increasing its effectiveness but also requires the development of new competencies helping the university teachers adapt to and thrive in an evolving educational landscape, fostering a more engaging and

insightful learning environment for students. Modernising curricula and designing teaching that reflects current and future challenges is becoming crucial for preparing students for professional life in a dynamically changing world.

The development of AI and its applications in higher education offer several benefits. For example, generative multimodal models such as ChatGPT 4 Plus enable an interactive form of learning that adaptively caters to students' needs and learning pace.

At the same time, integrating AI into the classroom promotes the development of critical thinking and analytical skills by exposing them to more complex problems and simulations that better reflect reality. Indeed, with the use of AI-driven instructional design applications, learning evolves into a truly immersive experience, and – from the viewpoint of pedagogy – immersive learning assumes its specific contours.

However, this shift means challenges, particularly in teacher preparation and training. Before using AI effectively in their teaching, teachers must be equipped with new competencies and a profound understanding of how to work with the new technology. This includes technical skills and the ability to reflect critically on the ethical and social aspects of using AI in education.

Therefore, curriculum modernisation has to go hand in hand with a teacher training programme to ensure the seamless integration of AI into teaching and help enhance all students' education quality. This process requires close collaboration among educational experts, instructional designers, technology developers, teachers, and educational administrators. Participation of teams from different fields will guarantee that curricula are relevant, up-to-date, and ready to meet future challenges.

Preparing teachers and students for the new realities of learning is essential. With AI present everywhere, students are expected to understand both AI and its huge potential and limitations. Teachers and their students must together navigate the information provided by generative multimodal models and other AI-driven tools. This means responding to what is presented to them, evaluating it, and making sense of it – only then can it be successfully integrated into their learning journey in a natural and productive way.

Education in AI literacy should include the ethical aspects of using AI as an integral part of the curriculum at all levels of study. Students will understand how AI and numerous AI-driven applications work. They can identify and address potential bias and other ethical dilemmas. An important step towards reaching this goal is to become familiar with the AI Act, adopted in March 2024. University study programmes will prepare students to use AI effectively and responsibly. It is believed that understanding AI and mastering its related skills are crucial for students to prepare for their future careers, arming them with the tools needed to navigate the professional world ahead.

Teaching AI literacy should go beyond just the technical, the ethical implications of AI use into the very fabric of the curriculum should be taught at every level of education. This includes not only grasping how AI and its myriad applications function but also equipping students with the critical thinking skills necessary to spot and tackle any biases and ethical issues that might emerge. A pivotal moment in this educational journey was the already-mentioned adoption of the AI Act in March 2024 (European Parliament, 2024), setting a significant milestone towards achieving this comprehensive understanding and application of AI.

Comprehending AI and honing the skills it encompasses are indispensable for students as they gear up for their professional career, providing them with the necessary tools to negotiate effectively the complexities of the future workplace.

At this point, it is also worth reflecting on the inevitable organizational changes that will necessitate an innovative instructional design, the teaching methods used and the entirely new nature of the interaction between teachers and students. In the context of organizational changes in higher education, design thinking offers enormous potential for innovation and process enhancement. This approach allows universities to react in a more flexible and creative way to rapid changes in the learning environment. Design thinking is predominantly based on empathy. This approach puts people at its heart, delving deep into what everyone involved truly needs and hopes for – be it students, teachers, and administrative staff. In this way, higher education institutions can adopt changes and design study programmes that are not only technologically advanced but also very sensitive to the social and pedagogical aspects of teaching.

Design thinking is an innovative approach to change management processes, and it allows universities to experiment with new forms of teaching and adapt the learning environment to the needs of the current generation of students. Simultaneously, it helps maintain the high quality of education and its accessibility. This approach also supports the development of multidisciplinary teams that work together to design and implement innovative solutions. The composition of these teams transcends traditional academic disciplines. One can start the process of integrating design thinking into the day-to-day operations of higher education institutions, and applying design thinking into the process of higher education, lay the groundwork for education systems that are adaptable, welcoming, and deeply rooted in the student experience. With this approach, equipped with a resilient and forward-thinking education, it will be possible to navigate the meanders of the 21st century with self-confidence and curiosity.

Another key idea concerns the need to transform tertiary education. The current evolution of the educational environment and increasing external pressures require university teachers to adopt a positive attitude towards learning new skills and applying innovative methods of instruction (Walter, 2024). The dynamics of societal

development lead to reflecting critically on the current state of affairs and to adapting teaching processes to better fulfil the demands of modern times.

Even though the discussions on the necessity for innovation in higher education have persisted for quite a time, reactions to emerging trends tend to be slow. As early as the 1990s, there was a widely adopted positive approach towards interactive learning methods within universities. Nevertheless, the current situation finds us at a juncture where one must advance beyond those initial steps. Present times call for experiential and immersive learning as well as virtual reality and extended reality that inform and educate students and, more importantly, engage them in the learning process more profoundly and frequently. It motivates them to understand the learning materials more deeply and actively participate in learning. This transformation of learning brings new challenges for all parties involved, yet at the same time offers enormous potential for developing skills and competencies that will be highly valued in the future.



8.2. The Evolution of Tertiary Education and Competencies

Historical Perspective

A brief look at how university teaching was traditionally approached, and the competencies previously emphasised.

To thrive in today's society, individuals need to master working with technology critically and intelligently in their professional and personal lives. Understanding the principles of technology along with the ability to influence, modify, and shape the digital environment is key to using technology meaningfully. It is also important that people are ready to react to the inevitable changes in the job market, especially those positions that will not survive the digital transformation towards Industry 4.0 and Society 4.0 while adapting to new occupations and professions in the process of reskilling and upskilling. This trend is being recognised by many countries, which are trying not only to introduce technological innovations in education but also to equip school leavers with the certificates that are needed in the labour market.

Digital literacy and digital competence concepts are often intertwined in the education and skills environment. The concept of new literacies has emerged with the development of technology and the gradual realisation of how it transforms our work, social, and personal lives. For example, the advent of the Internet has opened up opportunities for wide access to information, new forms of communication, and advanced e-learning models. However, it has also exposed users to various internet threats (Force, 2013).

The narrowest digital concept was ICT literacy, which focused mainly on technical knowledge and the use of computers and software applications (Ala-Mutka, 2011). This was followed by Internet literacy, which expanded knowledge and skills, tools and abilities to function successfully in a networked media environment. The other two concepts, information literacy and media literacy, overlap to a large extent. However, the former term is more about the ability to find, organise and process information. At the same time, whilst the latter is more about the ability to use and create media for one's own benefit, hence in both cases a critical approach is emphasised. Two other concepts, information literacy and media literacy, overlap to some extent as well. Information literacy involves the ability to find, organise and critically process information. On the other hand, media literacy focuses on the skills to use and create media to one's own advantage, where a critical approach to information is a key element (Rojek et al., 2020).

Digital literacy refers to the ability to use computer networks to access resources and the ability to work with these resources, and in a narrower sense, the ability to work in an online environment and assess online information (Jeřábek et al., 2018). According to the American Library Association (American Libraries, 2013), digital literacy is the ability to use information and communication technologies to find, verify, create, and transmit information that requires both cognitive and technical skills. According to Martin (2008), digital literacy is the ability to successfully perform digital activities (the ability to work effectively with digital technologies) in various life situations, including work, learning, leisure, and other aspects of daily life. Costello (2018) stated that the level of digital literacy is already increasing as we live in an era of mobile technology, with ubiquitous smartphones and tablets, the convenience and flexibility of getting information quickly, and access to cloud services from anywhere. However, it is believed that the development of digital literacy cannot be seen as an automatic consequence of the use of technology, as the very concept of digital literacy contains components that cannot be acquired in this way.

In Europe, the concept of digital literacy was based on the Key Competencies for Lifelong Learning (Recommendation of the European Parliament and of the Council of 18 December 2006...), in the field of ICT it was *the use of computers to retrieve, evaluate, store, create and exchange information, as well as to communicate and collaborate within networks via the Internet*. In line with the definition of the term approved by UNESCO (2018), digital literacy is defined as a set of competencies needed to understand, interpret, create, communicate and use digital technologies effectively and safely to improve the quality of life and the environment, for work and personal fulfilment, to develop personal potential and to maintain or increase participation in society. A gradual shift from a micro to a macro perspective is increasingly evident within this broad framework. In other words, the concept of digital literacy no longer refers only to individual capabilities. Yet, one begins to consider the social or community context

in which digital literacy becomes a tool for social participation (Iordache et al., 2017). The reason is the penetration of new technologies into everyday life, which raises the question of so-called digital well-being, understood as a set of skills by which an individual can counter the side effects of an excess of digital communication, avoid the stress of accelerated information flow, and minimise the negative effects of living with digital technologies, such as wasting time or paying attention to irrelevant activities (Gui et al., 2017). In this context, an important goal of digital literacy is to be able to use digital technologies responsibly, for personal development and for the benefit of others.

Competence is a complex category that is not based on a single skill but represents a set of knowledge, skills, abilities, attitudes and values. The Pedagogical Dictionary defines teacher competence as a set of professional skills and dispositions that a teacher should be equipped with to effectively perform his/her profession (Průcha, 2019). This topic has been discussed since the 1970s, especially in Germany, in the context of economic and social changes in society and new social needs. A key question has been whether the educational system is relevant to these new needs and whether the content of education is relevant in the context of a changing society. In 2006, a recommendation of the European Parliament and the Council of the EU was published (European Union, 2006), which led to further discussion on teacher competencies.

The notion of competence was followed by some teacher requirements regarding knowledge, skills and abilities. Janík et al. (2007) assert that, in addition to knowledge and skills, attitudes, values, and possibly even character traits, are also represented. Furthermore, it was assumed that the teacher would contribute to the completion of competence through his/her pedagogical and social creativity, e.g., according to Kratochvílová (2007), being a co-creator of the curriculum, its innovator, user, implementer and evaluator. There was also talk of key professional competencies and personal competencies, e.g. in the study by Vašutová (2004). Furthermore, personal competencies were considered an automatic part of professional competencies and Průcha et al. (1998) emphasised communicative, managerial and diagnostic competencies. It has been argued that competencies must be operationalisable and cannot be limited to mere technology control. For example, as stated in the subject matter competencies, a teacher can transform the way knowledge of a given subject is conveyed into how students think about and understand that subject. Furthermore, the didactic and psycho-didactic competencies state that teachers can use ICT to support student learning. It was emphasised that the teacher's professional competencies are important for effective teaching and are also an important prerequisite for his/her authority.

The development of tertiary education and competencies tends to be a major focus of much research. Ugarte and Naval (2010) looked at the development of professional competencies in higher education, with Ginarte emphasising the

shift from occupational to educational competencies. They highlighted the role of specific professional competencies in higher education. Kulik et al. (2020) discussed the competency approach in higher education and stressed that practical skills and competencies are needed in addition to basic knowledge. However, Brunner (2008) warned against blindly adapting universities to the changing dynamics of labour markets and suggests a more nuanced approach to the relation between tertiary education and the labour market. The traditional approach to university teaching is heavily research-oriented, with teaching often sidelined (D. E. Scott & S. Scott, 2010). This can lead to a misalignment between the needs of students and the priorities of lecturers. The need to prioritise effective teaching and learning through digital technologies comes to the fore – for example, creating effective learning content, developing students' skills and integrating digital technologies into the curriculum. A more student-centred approach is emerging, emphasising individual student needs, as noted by Meng-xi (2010).

In an attempt to ensure that our educational systems remain relevant and effective in meeting the demands of today's rapidly evolving digital landscape, it is essential to revisit and elaborate comprehensive digital competencies modules. These comprehensive modules encompass crucial digital competencies such as (Svoboda et al., 2020):

- e-learning and online communication tools,
- digital competencies and digital technologies,
- innovative didactic tools in teaching and interactive technologies,
- cloud applications and other services in the school environment,
- digital technologies in teaching and school management,
- searching for information on the internet and digital technology security.

The above must be meticulously evaluated and enhanced, and by doing so, ensuring that they align with changing educational needs, preparing students and educators to navigate and thrive in a world where digital fluency is beneficial and indispensable. This continuous process of revision and improvement will help cultivate an educational environment that is both innovative and secure, fostering learning that is truly reflective of 21st-century digital experience and related digital competencies.

Along with the transformative steps in education, we must acquire a new set of skills relevant to the newly emerging situation. Almost overnight, teachers are expected to start using new methods to engage, instruct, and inspire students. However, a pivotal question arises: Who will teach the teachers? This query underlines the need for robust, ongoing professional development programmes. Educational support will equip educators not just to adapt but to excel in this new era. Newskilling will ensure that teachers will be well-equipped to foster a learning environment that is both dynamic and relevant (Svoboda, 2020).

New Competencies for the AI-Driven 21st Century

This section explores the new competencies considered crucial for university teachers in the context of rapid technological progress and evolving societal demands. The advent of generative multimodal models has revolutionised the educational landscape, necessitating a profound change in teaching methods, the seminars' structure, and the design of project tasks.

Below, the new digital competencies are systematically organized into two tables to ensure a clear understanding. Table 8.1 outlines the digital competencies adopted so far, while Table 8.2 looks into their augmentation with AI.

Table 8.1. Digital competencies and objectives

Digital competency	Objective (Why We Need It)
Digital literacy	Using digital technologies to effectively search, use, summarise, evaluate, create, and communicate information.
Digital content creation	To enhance learning by creating engaging digital content like presentations, videos, blogs, and podcasts.
Data literacy	Collecting, managing, evaluating, and interpreting data is essential for personalised learning and assessment.
Online communication and collaboration	To utilise online digital platforms for effective communication and collaboration with students, parents, and colleagues.
Digital pedagogy	To integrate digital tools into teaching methods and practices to support and enhance student learning.
Technology integration	To improve educational outcomes by seamlessly incorporating various technologies and applications into the curriculum.
Adaptive, personalised and immersive learning	AI and other technologies should be used to adapt teaching strategies to meet individual student needs and promote personalised and immersive learning experiences.
Critical thinking and design thinking in the digital world	To critically assess the reliability and credibility of online sources and digital content and apply design thinking for creative problem-solving.
Cybersecurity awareness and ethics	To understand online safety, privacy protection, and ethical considerations in using digital tools and resources.
Interdisciplinary collaboration in teaching and learning	To foster an environment where students and educators can collaboratively engage across disciplines, enhancing creativity, problem-solving, and comprehensive understanding.

Source: own elaboration based on (Redecker, 2017).

As technological advancements periodically introduce new software programs and applications, it has become an established paradigm that university educators commit to ongoing lifelong learning. The rise of the AI-enhanced educational paradigm is no exception to this rule. University teachers recognize the profound opportunities

these tools offer to enhance educational experiences for their students. However, to effectively leverage these opportunities, educators must first be knowledgeable and skilled themselves, ready to continually refine their abilities. This dynamic approach to learning ensures that educators are well-prepared to embrace future innovations. Universities play an active role in timely preparing and disseminating essential information to all stakeholders involved (Plíhalová & Kopecký, 2024).

Universities and other educational institutions must cultivate a culture of perpetual learning and an open attitude towards new AI-driven applications. They recognize their capacity to transform the learning environment, making it more personalised, engaging, and immersive for their students. This transformation of education is crucial for the effective acquisition of knowledge and skills that are increasingly valued by future employers. Moreover, it is a visible trend that employers are currently seeking employees with a working knowledge of AI applications. These logical requirements highlight the importance of integrating these competencies into educational curricula (Svoboda, 2022).

Thus, the logical requirement for further education leads to the next level of competencies, i.e. digital competencies enhanced by AI. Table 8.2 shows the process of AI-augmentation of the fundamental digital competencies of university educators including the expected results.

Table 8.2. Digital competencies, AI augmentation, and expected results

Digital competency	AI-augmentation	Expected results
1	2	3
Digital literacy	AI-enhanced educational platforms for interactive learning	Enhanced ability to navigate digital resources and tools
Digital content creation	Content generation tools for creating diverse educational materials	Increased engagement and diversified learning materials
Data literacy	Data analysis tools for personalised student feedback	Improved personalised learning experiences
Online communication and collaboration	AI-driven communication platforms for enhanced collaboration	Streamlined communication and teamwork among educational stakeholders
Digital pedagogy	AI models to support teaching strategies and curriculum development	Innovative teaching methods and curricula that meet modern needs
Technology integration	Intelligent tutoring systems and educational software	Seamless integration of technology into teaching and learning
Adaptive, personalised and immersive learning	Learning management systems with AI for tailored learning paths	Improved student satisfaction and performance with customised learning materials

Table 8.2, cont.

1	2	3
Critical thinking and design thinking in the digital world	Critical thinking tools to evaluate information credibility	Strengthened critical evaluation skills in a digital context
Cybersecurity awareness	AI systems for cybersecurity education and simulation	Heightened cybersecurity practices and understanding
Interdisciplinary collaboration in teaching and learning	AI-facilitated platforms and tools that encourage cross-disciplinary projects and discussions	Enhanced creativity, problem-solving capabilities, and a broader perspective through interdisciplinary engagement
Continuous professional development	AI-curated resources for ongoing teacher training	Continuous professional growth and adaptability to new technologies

Source: own elaboration.

Table 8.2 concisely illustrates how artificial intelligence can elevate existing digital competencies among university educators. Being self-confident, university educators can integrate AI tools and methods of instruction and teaching programmes, therefore the learning environment will be more dynamic, immersive and efficient. Consequently, not only students but also the teachers themselves will be well-prepared to thrive in an increasingly digital world. The above-mentioned expected results demonstrate the transformative potential of AI in education, promising more engaging, personalised, and secure learning experiences.

The Added Value of AI-Enhanced Competencies

Many challenges relate to the deployment of artificial intelligence in the digital transformation of higher education, ranging from overcoming organizational and cultural barriers to the possible fear of failure in implementing such a complex task. In fact, this pattern is not new; similar challenges were faced during major technological shifts such as the introduction of the Internet in schools, the onset of tablet use, and the advent of virtual reality. History seems to repeat itself as we navigate these pivotal changes.

The added value of AI-enhanced competencies lies in several key areas that collectively make education more effective, modern, and well-suited to preparing students for the realities of the world (Fig. 8.2).

Tertiary education is a pivotal element shaping our future, with innovative teaching methods at the heart of this transformation. These advanced teaching techniques, enabled by AI, make learning more personalised and immersive, allowing for deeper engagement in the subject matter.

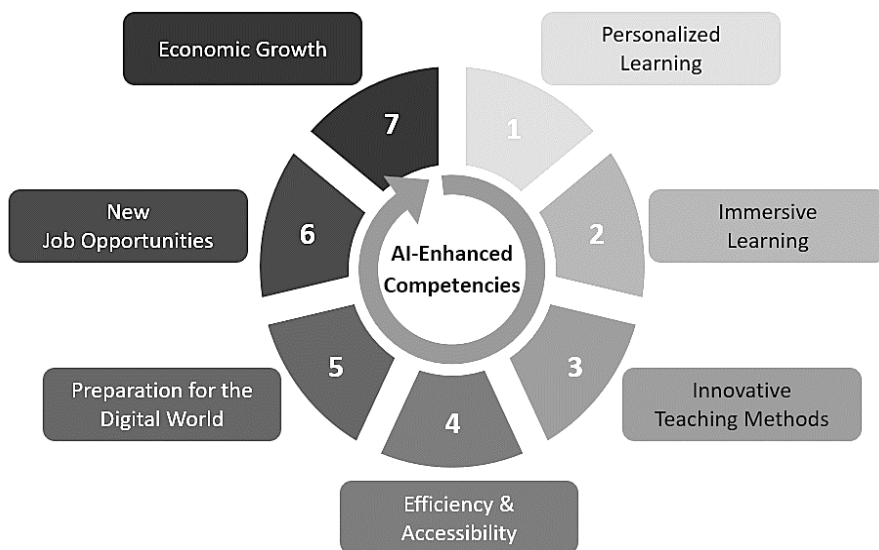


Fig. 8.1. AI-enhanced competencies' added value

Source: own elaboration.

In turn, this leads to better educational outcomes. Engaging and interactive, the AI-enhanced content becomes more memorable, ensuring that learners retain knowledge more effectively. These educational tools are indispensable for better preparing students to meet the challenges of the new job market. With AI as an ally, students are equipped with the skills demanded by current job opportunities, significantly improving their employability.

Each identified factor contributes to modern, efficient, and dynamic tertiary education, playing a role and adding value, which can be summarized as follows.

1. **Personalised learning:** AI allows for tailoring educational experiences that adapt to the individual learning styles, specific needs, preferences and progress of each student, thereby leading to student satisfaction when reaching better study results.
2. **Immersive learning:** immersive learning can be considered the next experiential learning level. While experiential learning is a broad concept that encompasses any learning process designed to allow learners to apply theoretical knowledge to real-world tasks (with its four stages, i.e. concrete learning, reflective observation, abstract conceptualisation, and active experimentation (VGU, 2021), immersive learning is more specific in its use of technology, including AI, to create a deeply engaging environment that simulates reality. The learning environment is complex for simulation and practice, ranging from virtual reality (VR) to augmented

reality (AR) and beyond, allowing students to experience and interact with the subject matter in three-dimensional spaces. This facilitates a high level of engagement and a sense of presence that traditional learning environments often cannot provide. Immersive learning helps teachers avoid distractions and keep learners engaged for a longer period, ideally even the whole lecture or seminar. It is set to become a transformative force in education (Kumar, 2022).

3. **Innovative teaching methods:** AI enables the development of innovative teaching methods and materials, including immersive learning experiences through simulations and virtual environments, making learning more engaging.
4. **Efficiency and accessibility:** AI-driven tools can streamline administrative tasks and make educational resources more accessible to a wider audience, breaking down barriers to education.
5. **Preparation for the digital world:** by integrating technologies and AI-driven applications into education, students gain firsthand experience with the working environments that are increasingly prevalent in the workplace. It is a precondition for more efficient students' preparation for their future careers. Consequently, for employers, a more reality-relevant preparation of students will lead to higher satisfaction and less investment in onboarding and training new employees.
6. **New job opportunities:** familiarity with AI and digital technologies equips students with the skills needed for emerging job markets, contributing to their employability and adaptability in a rapidly changing economy. With AI-enhanced digital competencies, students will be more employable.
7. **Economic Growth:** by fostering a workforce that is skilled in AI and digital technologies, education contributes to the innovation capacity and competitiveness of the economy of any business entity, potentially leading to new jobs creation and economic growth.

Based on the above, it can be concluded that AI-enhanced competencies offer a comprehensive approach to education that meets the demands of the AI-driven 21st century. This ensures that students are not only well-prepared for their future careers but also capable of contributing to societal and economic development (Svoboda, 2021).

8.3. Instructional Design in the Age of AI

Educators and learning materials creators, i.e. both teachers and instructional designers, focus on educational content development in appropriate formats to facilitate learning. Traditionally, we understood instructional design in education as the systematic process of creating educational experiences that make the acquisition of knowledge and skills more efficient, effective, and appealing. Usually, this process

involves analysing learners' needs, defining learning objectives, designing and organizing content, choosing instructional strategies, and assessing both the learning process and outcomes to ensure educational goals are met.

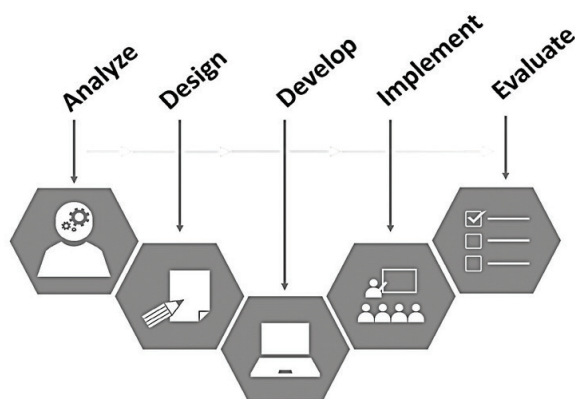


Fig. 8.2. ADDIE Model based on Schetchbubble design

Source: own elaboration.

In the methodology of teaching, this process is known as ADDIE (Fig. 8.2), which stands for Analysis, Design, Development, Implementation, and Evaluation. ADDIE is a widely recognized framework that serves as a guideline for constructing effective training and performance support tools in a consistent and reliable manner. Each phase of ADDIE involves a set of processes that contribute to the overall efficiency and effectiveness of learning by ensuring that the development and delivery of educational materials are tailored to meet the specific needs and constraints of the audience.

The Role of AI in Instructional Design

Meeting today's high standards, modern instructional design is distinguished by key principles: it should be motivating, well-organized, engaging, interactive, and adaptable. Regarding content, it ought to include elements of surprise to facilitate memory indexing, ensuring that learners leave with an immersive and memorable learning experience. This approach enhances retention and also fosters a deeper connection between the learners and the study material, setting the stage for lifelong learning and curiosity.

Exploring how AI technologies are shaping new requirements for instructional design, we must take into account potential changes to the ADDIE Model:

AI + Analysis: AI can offer deeper insights into learner needs and context through data analytics, potentially leading to a more nuanced understanding at this stage.

AI + Design: design strategies may evolve to incorporate AI-driven personalisation and adaptivity, requiring designers to think in terms of flexible learning paths rather than static content.

AI + Development: the development phase might involve the increased use of AI tools for content creation, potentially streamlining this process and allowing for rapid prototyping.

AI + Implementation: AI can support more dynamic and responsive implementation, with learning environments that adapt to individual learner needs in real time.

AI + Evaluation: AI could transform evaluation into an ongoing process, utilising learner data to continuously refine and improve the learning experience.

Examples of AI-enhanced Instructional Design Strategies

Highlighting case studies or examples where AI has effectively enhanced instructional design serves as a powerful motivation for anyone interested in pursuing this innovative approach. Successful AI-enhanced instructional design implementation can be exemplified by Duolingo and Coursera's AI Tutor in which AI has successfully augmented instructional design, enhancing both teaching and learning experiences.

1. **Duolingo:** a successful language learning platform that uses AI to personalise learning paths for users. Its AI algorithms assess a learner's strengths and weaknesses, adapting the curriculum to meet their individual needs and pace. This personalised approach helps keep learners motivated and engaged, significantly improving language acquisition.
2. **Coursera's AI Tutor:** Coursera, an online learning platform, has experimented with AI tutors to augment its courses. These AI tutors play several roles: they can grade assignments, provide instant feedback, and answer student queries, mimicking some aspects of human interaction and support in online learning environments.

These examples illustrate the diverse applications of AI in instructional design, from personalised learning and adaptive feedback related to the generation of customised content. By leveraging AI, educators can create more engaging, effective, and responsive learning experiences that cater to the varied needs of students.

8.4. Newskilling University Teachers for an AI-augmented Era

Proceeding through an era marked by rapid technological advancements, we all fully realise that the landscape of higher education is undergoing a significant transformation in every aspect of tertiary education. Artificial Intelligence is at the

forefront of this fundamental change, as it reshapes the traditional paradigms of teaching and learning, which profoundly changes the instructional design process. To thrive in this evolving environment, university teachers must not only adapt but also excel in their role as thought leaders and evangelists sharing innovative educational paradigms. They can excel by timely acquiring new skills that align with the demands of AI integration in education. This chapter examines the critical need for ‘newskillings’ – a process of updating the skillset of educators to include AI and digital technologies. The chapter explains very clearly the difference in meaning related to reskilling, upskilling and predominantly newskilling as crucial strategies driving the transformation of the job market in the near future ensuring that all job seekers, including university graduates, are well-equipped for the challenges and opportunities of the 21st century.

Understanding Newskilling

The term ‘upskilling’ has been on the agenda of educators and corporate HR specialists for some time. In the iconic article for MIT Sloan Management Review, Gratton wrote about the initiatives emerging in the World Economic Forum already in 2017: *At Davos this year, an initiative called the Reskilling Revolution launched that saw both companies and governments pledging to reskill and upskill* (Gratton, 2020). In an attempt to define newskilling and its importance in the professional development of business managers and university teachers alike, it is important to distinguish this term as a new developmental stage in the process of acquiring certain types of skills (Tab. 8.3).

Table 8.3. Types of skill development strategies

Skill Development Category	Definition
Reskilling	acquiring new skills to move from an obsolete job to a new one ; it involves training people in completely new subjects so that they can move from one job to another
Upskilling	acquiring new skills that are needed for the position that an employee is currently performing ; it is about developing new skills as new technologies appear in the field of their position and, therefore, being more competitive within the professional sphere
Newskilling	the need for continuous learning that organizations have for those competencies that are going to be in high demand for the improvement of the professional and at the same time the success of the business; mastering AI-enhanced digital competencies or AI-driven applications are typical examples

Source: (Qaleon, 2022).

When considering the evolving role of AI in education, it becomes clear that educators need to grow alongside these technological advancements. The following

section deals with different strategies for AI-enhancing digital competencies, looking into the various methods and programs that can be employed to enrich the current skill sets of university teachers with AI and technology-focused skills.

Strategies for Augmenting Competencies

This research would not be complete without examining the various educational formats, programmes and methods available to enrich the existing competencies of university teachers with AI-driven and technology-focused skills.

In their educational opportunities' portfolio, HR professionals, together with training providers, continuously refine and perfect methods and programmes to enhance the existing competencies of university teachers with AI and technology-focused skills. Each of the following educational opportunities serves its own specific purpose. In essence, educators can create the so-called Personal Learning Environments (PLE) with the aim to harness the potential of various digital and interactive tools to create a personalised and integrated learning experience that extends learning opportunities beyond traditional classroom settings.

1. **Professional development workshops:** tertiary education institutions may organize workshops and training sessions that introduce innovative AI concepts, tools, and applications highly relevant to teaching practices.
2. **Collaborative learning communities:** by making use of social media platforms, mainly LinkedIn e-communities, we can establish and successfully operate learning communities where educators can share experiences and strategies for integrating AI into their teaching.
3. **Certification programmes:** offering certification programs in educational technology that focus on AI applications will help teachers formalise their understanding and skills.
4. **Online courses and webinars:** using various online platforms to provide teachers with barrier-free access to courses and webinars taught by experts in AI and educational technology. Many of these experts might leverage their knowledge and skills within their pro-active attitude to ESG activities and sustainable initiatives.
5. **Mentorship programmes:** here, one can imagine pairing teachers with AI specialists or tech-savvy mentors who can provide personalised guidance and support.
6. **Technology grants:** a unique opportunity lies in providing grants or funding opportunities for teachers to explore AI integration in their curriculum or research. New grants are currently being prepared by relevant institutions. Their main focus is on fostering tertiary education curricula and syllabi.

7. **Cross-disciplinary projects:** in today's interconnected world, the lines between disciplines blur, revealing the rich potential of collaboration. Teachers are encouraged to engage in projects that bridge different disciplines and introduce AI into the fabric of their work. This means joining hands across disciplines to unlock AI's full potential and bring a wealth of perspectives to light.
8. **Sabbaticals for tech education:** some of the projects based on AI might be very time-consuming. Therefore, offering sabbaticals or dedicated time for teachers to study and explore AI advancements and their implications for education is not only needed but a priority. University teachers need space to explore, understand, and bring back insights that can 'light up' our classrooms.
9. **Integration of AI tools in teaching practice:** supporting teachers in the use of AI-powered educational tools will lead to fundamental changes in the design of the teaching methods and lectures or seminars' structure and content. It is important to enable access to adaptive learning platforms, learning data analytics, and AI tutoring systems, making the most of an immersive learning experience.
10. **Research and development opportunities:** these demanding changes are of utmost importance for the educational system and have very promising results. Therefore, it is important to incentivise teachers to participate in or even lead research projects that examine the impacts of AI on teaching methodologies and student learning results.

Taking a closer look at each of these strategies will help educators identify the most relevant educational opportunity to the given situation. They are all designed to empower university teachers with the knowledge and capabilities needed to harness AI's advantages in their demanding jobs. Mastering the necessary knowledge and skills will increase their self-confidence and enrich their teaching practices. Consequently, their students will be much better prepared for a future where AI is ubiquitous.

8.5. Modernising the Curriculum: Integration of AI and New Competencies

Curriculum Development for the Future

University educators realise that they must design modern curricula that incorporate AI and other technological novelties. Modernising curricula through the integration of AI and new competencies is a challenging task, and a strategic approach has to be adopted to meet these requirements.

The importance of **interdisciplinarity** has already been mentioned since it is growing in importance across all study programmes (Pavlát et al., 2023), be it man-

agement, marketing, accountancy science, or art. An interdisciplinary attitude to the new curriculum design will lead to crossing traditional academic boundaries of individual disciplines and, consequently, to solving complex real-world problems with greater ease.

AI-assisted personalised learning can achieve higher efficiency in study programmes. Thus, educational content can be adapted according to topic selection and difficulty to suit individual students' needs and learning styles.

Within the **data-driven curriculum design**, AI will be deployed to analyse a student's performance data, which will form the basis for tailoring curriculum development. This ongoing process can be automated, ensuring that the study program responsively adapts in a timely manner to each student's changing needs.

The process of modernising the curriculum can be significantly enriched through **project-based learning involving AI**. In these experiences, students engage with a range of AI-driven systems, software, and applications, thereby deepening their understanding of theoretical concepts and enhancing their practical skills.

Additionally, establishing **industry and academic partnerships** with tech companies, experts, and academicians from various fields can provide students with deeper insights into how AI is applied in the workplace. This collaboration enables the preparation of immersive learning experiences tailored to real-world application.

Creative problem-solving, critical thinking, and design thinking, all within the context of AI, can serve as powerful tools for innovation. Integrating these principles into the curriculum can lead to exceptionally outstanding results.

Last but not least, the **ethics of AI** – including the ethical implications such as data privacy, biases in machine learning, and the societal impacts of automation on the job market – must be carefully considered. Additionally, compliance with the AI Act and other relevant legal norms must be ensured.

Contemplating the role of various aspects to be taken into consideration while designing modern curricula unveils the whole process as a dynamic intersection of AI technology with educational practices. Thus, the need for curriculum innovation becomes apparent, emphasising the importance of forward-thinking curriculum development that equips students with the competencies required in an increasingly AI-integrated world. By embracing this approach, educational institutions can prepare learners not only to adapt to technological advances but also to excel in a future where AI is commonplace.

Balancing Technology and Human Touch

Wired Insider, a reputable segment of Wired Magazine, recently published an insightful opinion stating: *If we design, develop, and deploy technology without the right combination of human perspectives and understanding woven in, we risk building*

something with poor user experience and inappropriate functionality as well as potentially jeopardizing cyber security and resilience (Balancing Act..., n.d.).

Nowadays, many sociologists and psychologists are addressing the fundamental question of how to preserve the humanistic essence of teaching while integrating technological advancements.

Technology is indeed transformative, significantly altering our lives and sometimes at a pace that is challenging to keep up with. Yet, despite these rapid changes, the human touch such as personal encouragement, sharing life experiences, and fostering genuine connections remains invaluable. These elements make university education uniquely special, which begs the question: Will teachers still be needed? It is obvious that modern technology can enhance the educational experience. However, it cannot replace the critical human elements of empathy, understanding, and mentorship. These are those human traits that teachers provide and students need, expect, and benefit from.

What will the future of AI-enhanced tertiary education look like? We must create a balanced learning environment where the human touch pervades, and where teachers are readily available for their students. Even student interactions with generative multimodal models and AI-driven applications will yield better outcomes in such a setting. Only then can we develop a more engaging, immersive, and effective learning environment that meets the needs of future generations of students and benefits our society as a whole.



8.6. Conclusions

In concluding the exploration of AI-enhanced digital competencies in tertiary education, it becomes clear that the integration of AI not only redefines instructional strategies and curriculum development but also demands a re-evaluation of the roles and competencies of university educators.

This chapter highlights the transformative character of the current era in higher education, while the transformation is driven by AI and emerging technologies, and shows how AI can customise educational experiences to individual learner profiles to benefit from newly emerging adaptive learning systems. Educators and their students enjoy a deeper engagement with learning materials. University teachers are expected to continuously improve the technique of immersive learning, and ever more integrate interactive technologies. The discussions have highlighted the dual necessity of embracing technological advancements while ensuring that the essential human elements of education – empathy, critical thinking, and interpersonal connections – are not overshadowed.

The comprehensive exploration of this topic has revealed the imperative of newskilling – updating the skill set of educators to incorporate AI and digital technologies. It is evident that newskilling is no longer optional but essential for keeping pace with the demands of contemporary educational environments.

Another significant insight is the need for a thoughtful and balanced integration of AI within education, alongside human-centric pedagogical approaches. This strategy is crucial for preserving the humanistic essence of teaching and the relations between students and teachers.

Lastly, ethical considerations are of paramount importance as AI becomes increasingly embedded in educational systems. These include issues related to data privacy, bias, and the impact of AI on the job market, which are becoming increasingly critical to address.

In conclusion, the authors of this chapter assert that the transformative potential of AI and new competencies in university teaching holds the promise to revolutionise educational delivery, equipping students with the essential skills needed to thrive in an increasingly digital and interconnected world. Simultaneously, the role of the university educator, equipped with AI-enhanced digital skills, is recognised as both prestigious and vital for society. These educators play a crucial role in training students, ensuring high-quality tertiary education that enhances employment opportunities in the job market and also facilitates career progression in the future.

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